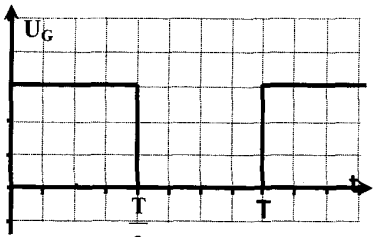
b-

α– méthode de tangente : $\tau=10ms=10^{-2}s$

$$\tau = RC \Rightarrow C = \frac{\tau}{R} = \frac{10^{-2}}{100} = 10^{-4}F$$

β– $U_0=6V$

$$N = \frac{1}{T} = \frac{1}{8\times 10.10^{-3}} = 12,5Hz$$




4°)

a- Loi des mailles (décharge : $u_G=0$) [2]

$$u_C + u_R = 0 \text{ or } u_R = Ri = R.\frac{dq}{dt} = RC\frac{du_C}{dt}$$

$$\Leftrightarrow \frac{du_C}{dt} + \frac{1}{RC}u_C = 0$$

b-

$$u_C = 6e^{-\alpha t}$$

$$\frac{du_C}{dt} = 6\alpha e^{-\alpha t}$$

$$\text{d'ou} \quad 6.\alpha.e^{-\alpha t} + \frac{6}{RC}.e^{-\alpha t} = 0 \Rightarrow 6.e^{-\alpha t}(\frac{1}{RC} - \alpha) = 0$$

$$\Rightarrow (\frac{1}{RC} - \alpha) = 0 \Rightarrow \alpha = \frac{1}{RC} = 100\,s^{-1}$$

c- $u_C = 6.e^{-100t}$ (en V)

5°)

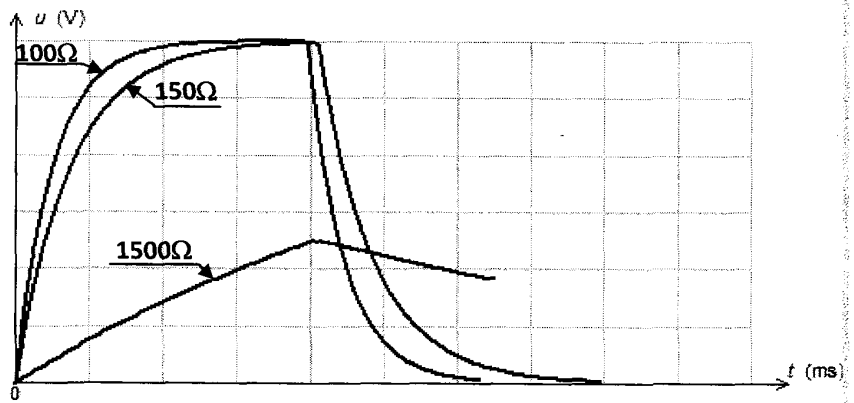
a- $U_0=6V$ : tension du générateur ne change pas

$$I_{max} = \frac{U_0}{R} \text{ si } R\nearrow \Rightarrow I_{max}\searrow$$

b- fig 4

$R=150\Omega$ $\tau=RC=15ms$

$R=1500\Omega$ $\tau=RC=150ms$

La durée de la charge $\Delta t = 5\tau = 750ms >> \frac{T}{2}$ or $\frac{T}{2} = 50ms$

Le condensateur n'a pas le temps de se charger